National Cooperative Dairy Herd Improvement Program

RECORD BOOK

A plan for every size herd

STANDARD DHIA OWNER SAMPLER WEIGH-A-DAY-A-MONTH

AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

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Dairy-Herd-Improvement Letter

July-August 1964

GENETIC EVALUATION PLANS FOR 1964-1965

Sire Summaries

As in 1963-64, sire summaries will be provided quarterly and will include all sires initially qualifying, sires active in AI, and special requests. Previous evaluations of all other sires will be updated on a semiannual basis when the records available include a 50 percent or greater increase in number of progeny. Each of the four production runs will require approximately 1 month and is scheduled as follows:

A. August

1. Sires initially qualifying with five or more progeny.
2. Sires active in AI.
3. Special requests.
4. Sires having a 50 percent or more increase in number of progeny since the previous summary.

B. November

1. Sires initially qualifying with five or more progeny.
2. Sires active in AI.
3. Special requests.

C. February

(Same as August)

D. May

(Same as November)

Issued September 1964

One minor change will be made in the formats of the Individual Sire Record (USDA 1202) and the Sire Summary List. A count of the number of herds (up to and including 25) represented in each AI sire summary will be made and printed on the appropriate form. This count will not exceed 25 herds because of mechanical limitations in current data processing procedures. Since sire summaries containing few herds are less reliable than those representing many herds, this count will provide a degree of visual assurance (or caution) as to the accuracy of the genetic evaluation in early summaries of bulls in AI.

The distribution of Individual Sire Records and the Sire Summary Lists will be as that of last year and as previously described in ARS-44-131.

Cow Performance Index List

As in 1963-64, the Cow Performance Index List will be provided semiannually. The publication will represent approximately the top 2 percent of the registered progeny of bulls currently being summarized, and will include the names and addresses of the herds represented. Plans are also being made to expand the cow index procedure to include not only the registered progeny of AI sires but other registered cows as well.

There will be no change in the distribution of the Cow Index publication that will result from production runs in November and May.

OPPORTUNITY FOR INCREASING PROFITS THROUGH USE OF SUPERIOR AI SIRES

Sire selection provides the dairyman with the most important single tool for genetic improvement. Bulls which are genetically superior in transmitting ability for production exist both in AI and in privately owned herds. While within herd summaries of bulls can be effectively used in predicting future performance in the same herd, they do not predict with accuracy future performance in other herds. Consequently, and with presently employed techniques, it is rarely possible to sample a bull in a single herd with sufficient reliability to recognize and exploit fully those

having real potential. On the other hand, AI provides the operational structure whereby bulls can be and are extensively sampled and tested and the good as well as poor ones identified with considerable accuracy. Outstanding bulls, which have been throughly tested in AI, provide dairymen at large with what is probably the best single opportunity for genetic improvement.

Considerable variation in breeding value exists among bulls in AI. The information in table 1, which reflects the production gain or loss to be expected from the use of AI sires, emphasizes the economic importance and consequence of these genetic differences. Dairymen using sires that have been thoroughly tested in AI and that have predicted averages exceeding the breed average by 800 pounds of milk should realize gross income gain of $30 per daughter over progeny of breed average sires. This difference becomes $60 per cow and $3,000 per 50-cow herd when the performance of bulls at +800 and -800 pounds of milk are compared. Bulls at these levels of breeding value do exist and are currently being used in AI. In the May 1964 DHIA Sire Summary List (ARS-44-145), 68 bulls were listed with breeding values of +800 or greater and 36 bulls with breeding values of -800 or less.

Although production increases realized through genetic gain will not be entirely free from such additional cost as involving feed and labor, these increased returns will enable the dairyman to improve his margin of profit. To accomplish this most effectively, breeders of grade and registered cattle alike must realize that AI provides (1) the operational structure whereby the breeding value of bulls is far more accurately determined than previously or otherwise possible, (2) the source of bulls having the best known breeding value, and (3) a wide variation in breeding value among bulls. It then follows that dairymen should maximize genetic gain in production, not just by breeding AI but by using bulls whose breeding value is known to be superior rather than inferior. The information needed to recognize the merit of such bulls is now current and readily available in educational or sire summary materials.

The practical impossibility for dairymen at large to breed strictly to thoroughly tested bulls that are known to

be genetically superior in AI must be recognized. It is well known that maximum genetic gain in a population of dairy cows requires that a number of bulls be continually sampled in many herds. The potential to be realized from such a young sire sampling program and the fact that it does not necessarily involve risk to dairymen will be discussed in a future issue of this publication.

The genetic potential that AI provides is applicable to either grade or registered cattle, at any level of production, and especially to the millions of cows now being bred by nondescript bulls.

INTERPRETATION AND USE OF INITIAL SUMMARIES OF AI BULLS

The transmitting ability of a bull for production is determined by comparing the performance of each of his daughters with herdmates in production tested herds. Each daughter represents a sample-half of the breeding value of her sire. Since the genetic composition of a bull is extremely complex, and since the performance of a single cow is considerably influenced by feeding and management, reliability of the progeny test depends heavily upon the number of daughters sampled. Also, the number of herds represented in the evaluation of AI sires is an important consideration. It is because of these things that page 1 of each Sire Summary List publication includes the following statement:

> "When a non-AI sire evaluation is based on 5 to 9 daughter-herdmate comparisons and an AI evaluation is based on 5 to 24 comparisons, these should be considered 'preliminary'."

There are indications that the first summaries of AI bulls tend to be biased downward as is evident from the following tabulation of 64 Holstein sires that were evaluated initially in July 1963:

Date of summary	Av. number of daughters	Av. difference from herdmates	
		Milk Lbs.	Fat Lbs.
July 1963	16.7	-514	-13
Nov. 1963	45.6	-177	- 3
Feb. 1964	76.9	-133	- 1
May 1964	96.6	-123	0

Among all 64 bulls, the average change in the daughter-herdmate difference from the initial to the second summary was 337 pounds of milk and 11 pounds of fat. Changes from the first to second summary often exceeded this amount considerably in individual bulls. After the initial summary, however, successive evaluations based on 40 or more daughters were reasonably consistent and in most instances should provide a satisfactory prediction of the bull's breeding value.

Research efforts designed to determine the specific source(s) of this apparent negative bias in initial AI sire summaries are in progress. On the basis of these findings, which should be available soon, appropriate steps will be taken in order to increase the reliability of initial and early summaries of AI bulls.

Users of USDA sire summaries are reminded to interpret "preliminary" evaluations as such and to exercise caution when the information involving AI bulls represents less than 40 production tested daughters having herdmates in fewer than 25 herds.

NOTES 1/

U. S. Farmers received an average of $3.94 per cwt. for milk sold wholesale to plants and dealers in July, up 16 cents from June. Fluid market milk, at $4.37 per cwt., was 22 cents higher while manufacturing grade milk, at $3.15 per cwt., was up 3 cents. (Pr 1, 7-64)

The average single quart price for the most common grade of whole milk delivered to homes in 25 major cities was 27.3 cents in early May. Out-of-store half-gallon prices averaged 45.9 cents. (Da 1-3, 5-64)

July milk production in the United States is estimated at 10,824 million pounds, slightly below July 1963 and 1 percent below the 1958-62 average for the month. July milk production averaged 675 pounds per cow and amounted to 1.82 pounds per person daily, compared with 1.85 pounds a year earlier. (Da 1-1, 8-64)

1/ From USDA Statistical Reporting Service publications: Agricultural Prices (Pr) and Milk Production (Da).

The number of milk cows in the United States in June is estimated at 16,072,000, about 3 percent below a year earlier. Milk cow numbers have declined each year since 1953, with an average decline of 2.7 percent. These decreases since last year ranged from 1.8 percent in the East North Central to 5.6 percent in the South Central regions. (Da 1-1, 8-64)

Reported conditions of dairy pastures for the United States averaged 69 percent of normal on August 1. This is 2 points lower than the relatively poor condition of a year ago and the lowest United States average for August 1 since 1954. (Da 1-1, 8-64)

Table 1.--Yearly gross income (gain or loss) to be expected from using AI bulls of different levels of breeding value

ABOVE AVERAGE SIRES

Level of superiority or inferiority of AI bulls from breed average for milk yield		Gross income gain or loss as compared to AI sires of average breeding value[1/]	
PA-BA[2/]	Cow-year basis[3/]	Per Cow (daughter)	Per 50-cow herd
Lb. Milk	Lb. Milk	Dollars	Dollars
+1,400	+1,281	+53	+2,650
+1,200	+1,098	+45	+2,250
+1,000	+ 915	+38	+1,900
+ 800	+ 732	+30	+1,500
+ 600	+ 549	+23	+1,150
+ 400	+ 366	+15	+ 750
+ 200	+ 183	+ 8	+ 400

BELOW AVERAGE SIRES

- 200	- 183	- 8	- 400
- 400	- 366	-15	- 750
- 600	- 549	-23	-1,150
- 800	- 732	-30	-1,500

1/ Gross income gain or loss is expressed as deviations from that expected of breed average sires and is based on the cow-year expression for milk valued at $4.11 cwt. (1962 average price for all milk in DHIA).

2/ USDA Predicted Average minus Breed Average.

3/ Cow-year values are expressed as (PA-BA) x .915 in order to convert 305-day M.E. production averages to a non-M.E. cow-year basis.

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